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ABSTRACT

Research has increasingly been oriented toward non-cognitive objectives, such as social relationships, anxiety, achievement motivation, and attitudes toward school. Sociometric techniques have been used as a graphic representation of choice of partner, with an intuitive interpretation, the teacher having no objective standards for assessing the degree of cohesion in the class. Petillon has developed an index to compare the social choices and social rejections in groups. Anxiety has been widely studied, but there is little theoretical agreement about the anxiety construct. Although several instruments are available, the measurement of anxiety in school practice is very rare: and there is general agreement that teachers underestimate the extent and effects of anxiety in school. Achievement motivation is recorded mainly through projective tests, which cannot easily be used by teachers. Because achievement motivation is so closely tied to achievement, many researchers are working on questionnaire methods of measurement. Though various attempts have been made to measure attitudes toward school, the relationship between this variable and achievement has not been proven. In some studies, it has correlated with other personality measures, but not with cognitive achievement. (BW)

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The Importance of Noncognitive Variables for Assessment and Guidance in Schools

Paper presented at the Sixth International Conference on Educational Assessment, 26-28 May, 198o, Sao Paulo, Brazil

In the past, measurement and evaluation at school was often limited to the assessment of cognitive factors, particularly intelligence and attainment, and even in Thorndike's large manual (1971b) the index lists many concepts in the measurement of cognitive characteristics, but words such as 'sociometry', 'achievement motivation' and 'self-concept' do not occur. This applies also to the *Encyclopaedia of Educational Research* (Ebel, 1969).

By contrast, in recent years non-cognitive objectives have been increasingly stressed in the curricular field, and there has been a new emphasis on social interaction, cooperation, and freedom from anxiety, rather than on achievement.

Bloom for example in his concept of mastery learning has stressed the importance of affective variables. (Bloom in Block 1971, Bloom 1976). But his concern are the "affective entry characteristics" toward a required learning task. He regards the initial affective characteristics as a complex compound of interests, attitudes, and selfviews and his interests are focused on three problems:

"(a) the concurrent relation of affective characteristics and achievement, (b) the predictive relation of affective entry characteristics to later achievement, and (c) the causal relations between affective characteristics and aspects

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of the learning process" (Bloom 1976, p.77). After an overview on some research findings he summarized, that affective characteristics are important in determining or influencing the student's achievement. "In general, we have estimated that affective entry characteristics can account for up to one-fourth (r = + .5o) of the variance on relevant cognitive achievement measures" (Bloom 1976, p.1o4).
For Bloom noncognitive variables are a mean to better outcomes in school learning. Later, I like to emphasize that social and affective characteristics of students are also educational goals in themselves. But looking at the present situation within the schools there are few methods for teachers to measure non-cognitive factors, and this is related not only to the long period of dominance of the cognitive objectives, but also to the lack of consistent theories, and the methodological difficulties of measurement in the non-cognitive field. Since some of the procedures developed in psychological research can be applied only by trained psychologists, the teacher is largely dependent on his own observations and interpretations, and he is even less of a specialist in this than in assessing attainment and intelligence.
It is not possible to give in this short report a theory of learning including the function of social and affective factors. Not knowing a theory which is commonly accepted, I can only recall to your mind some points of view to selected variables and demonstrate some of our research findings.

1. Sociometry - the measurement of social relationships

In the non-cognitive field, sociometric techniques have been used more than any other, and numerous sets of instructions have been published for teachers, who have in turn written countless examination papers on the use of sociograms for the measurement of interpersonal relationships. This emphasis can be explained not only from the simple application of choice of partners, but from a wider application in education. The leaders in sociometric technique listed by Bjerstedt (1956) (Terman, Bernfeld, Reininger, Hetzer, Vecerka, Lochner,

Maller, Cattell and Koskenniemi among others) include educational sociologists and psychologists. Moreno, who was instrumental in promoting the world-wide use of sociometric methods, and his collaborator Jennings, have discussed the application of sociometry in schools. From the comprehensive descriptions and reports published over the last decade (Evans, 1962; Nehnevajsa, 1962; Bastin, 1967; Lindzey and Byrne, 1968; Höhn and Seidel, 1969; Dollase, 1973), we have drawn mainly on Dollase, and with him dinstinguish between questionnaires, observation methods, and action tests.

In school questionnaires, pupils have mainly been asked to choose fellow pupils, and the question then arises as to whether different importance can be attached to the first, second, and third choices (and so on), and whether the pupils are guided in their choice to a greater extent by general or specific criteria. According to most investigations, the answer to the first of these questions is negative, but for the second the age of the pupils is important, children after puberty choosing various partners according to special criteria. Mandel (1959), for example, found that for pupils aged 13.8 years the correlation between choice of partner for playing and studying was only o.51. Dollase includes in his category of questionnaires, assessment scales in which each member of a group has to appraise every other member on a 5-to 8-point scale. Since the method is time-consuming, it is usually employed in educational research rather than school practice. Dollase also refers to the Social Distance Scale of Bogardus, and the Ohio Social Acceptance Scale.

Observational procedures are usually used for somewhat different aspects of social relationship, and unlike questionnaires, are seldom used for analysing partnerships, because of the time factor. However, systematic observation can give results more comparable to questionnaires (Borgatta and Crowther, 1965).

Dollase reported on comparative studies using different procedures, and recommended the selective method, with unlimited choice, for most cases. The statistical analysis of sociometric data has been developed by Bronfenbrenner (1944), Criswell

(1947), Boyle (1969) and (in Europe) by Schmidt (1967), but in schools it is generally sufficient to list the choices and draw the sociograms. Statistical analysis for use in schools has not been satisfactorily developed, and there is for example, no agreement on whether Criswell's index measures integration or dispersion of a class into small units (Hörman and Timaeus, 1961; Ingenkamp 1972).
This is, in a way, characteristic for sociometry - despite numerous techniques little is known about the object that is being investigated, and in his summary Dollase says:

"There is still no generally accepted theory on group structures, but at the moment only theoretic guidelines, discussions on partial problems and the adaptation of classical theories to sociometriy problems. Accordingly interpersonal relationships in groups are understood as interpersonal attractions and rejections (Moreno, 1934), as ways and channels between various persons (Ross and Harary, 1959), as perceptions and results of the process of perception (Tagiuri, 1962) or as forces or motions (Bjerstedt, 1956), and this genesis of interpersonal phenomena is explained according to psychoanalytic theory, without being able to claim that this list even approximately exhausts all the possibilities."

As for the testing of intelligence, the theoretical uncertainties have not prevented the use of sociometric techniques in schools, and Peters (1973) listed a series of studies on the social status of handicapped children, social structure of classes in different types of school and at different levels in school, and others showing the importance of sociometric information for improving teaching practice.
In Scandinavia, similar studies continually appear in the journal *Didakometry and Sociometry*, and also in *Pedagogisk Forskning* (Stensaasen, 1967; Sletta, 197o) and elsewhere.
Even in East Europe, where sociometry is suspect for ideological reasons (Dannhauer, 1962), it is applied here and there (Horstmann and Lüning, 1967).
The many (and at times very isolated) research reports cannot blind us to the fact that in school, sociometry is used principally as a graphic representation of choice of partner, with an intuitive interpretation, the teacher having no com-

parative or objective standards for assessing the degree of cohesion in his class. Moreover there is a lack of therapeutic proposals based on research results that constitute anything more than mere advice by other practitioners.
In our institute we tried to overcome some weaknesses of past research practice. One of my coworkers developed an index to compare the social choices and social rejections in groups with different sizes (Petillon, 1978).
The formula for the social choices index is

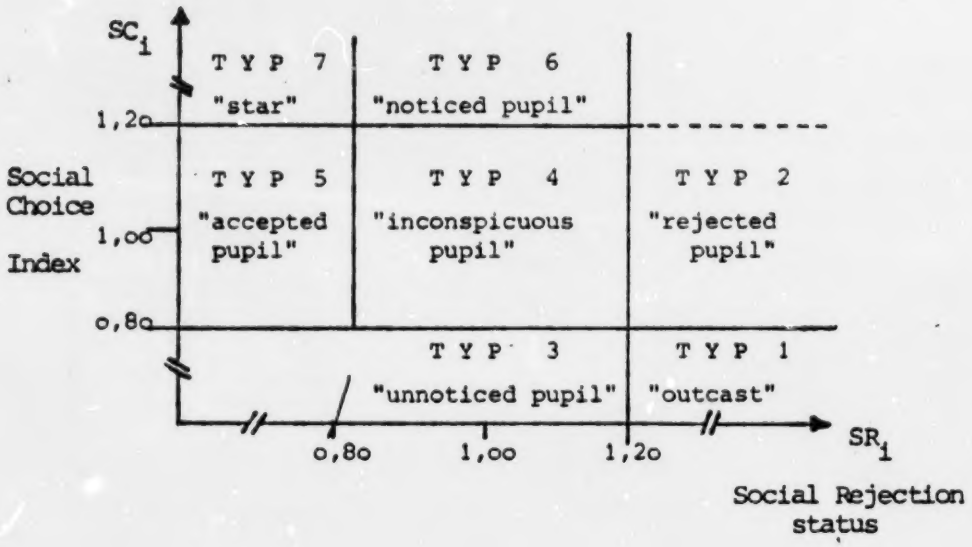
$$SC_i = 1 + \frac{NC - \bar{X}(C)}{Max\ C}$$

The abbreviations have the following meanings:

NC = number of choices the student received
$\bar{X}(C)$ = average number of choices which a student of a certain group received (mostly all boys or all girls within a classroom)
MaxC = maximal possible number of choices a student could receive within a group (i.e. the number of group members who elect a certain student).

According to this we can compute an index for social rejections. For the sociometric choices we require a question which has a real meaning for the students and we do not limit the number of choices and rejections per student.
This index is always 1 if a student receives an average number of choices independent of the size of the group. We can now operationalize different sociometric types according to the index. The following figure shows the types and the quantitative borders.

Figure 1: Quantification of sociometric types



I am sure English speaking people will find better names but I hope the systematic is clear.
Having such an operationalized system we have a better opportunity to compute and understand the reliability and validity of sociometric choices and rejections.
Before I show you some results I like to remind you of the correlations between sociometric indices and school achievement. In a big sample of 4th graders we found the following correlations.

Table 1: Correlation between school achievement and sociometric status

	Social choice	Social rejection	TYPE
Sum of marks in 3 subjects	.56	-.26	.55

The correlations descend in upper classrooms but there is a remarkable connection between success in school and sociometric status. Having this in mind you will recognize the importance of the following table. We made a follow up study with 924 4th graders who were tested again in the 5th grade after the transfer from Primary Schools to different Secondary Schools and a time intervall of 1o to 12 month.

Table 2: Stability of sociometric status after 1o to 12 month

Number and Percentage of pupils		
in the same sociometric position	in a better sociometric position	in a worse sociometric position
652	119	153
7o,6%	12,9%	16,5%

In other schools with other classmates around 7o% of all pupils are within a very short time in the same sociometric position. The stars and the accepted pupils have again a favourable base for success, the rejected and outcasts are again socially not accepted and in a bad position to improve their achievement.

If you want to break the cycle you cannot overlook the social position of students within their classroom. We need special social programs to improve the chances of the socially handicapped to become more accepted.

For the reliability of the sociometric method we found the following retest correlations after three weeks.

Table 3: Reliability of sociometric choices

	Social Choices (own sex)	Social Rejections (own sex)
Grade 3 (n=15o)	.81	.85
Grade 4 (n=161)	.89	.92
Grade 5 (n=19o)	.9o	.92
Grade 6 (n=2o1)	.91	.93
Grade 7 (n=182)	.92	.93

The reliability for choices and rejections toward the other sex is lower, between .39 and .79.
The social acceptance within the classroom is very important for the student's development. To help and to guide students a teacher should know about the social relations within his classes. In our institute H. Petillon constructed a standardized sociometric test to give norms for different grades and to make the results comparable (Petillon 198o).

2. The measurement of anxiety

Anxiety is probably the most frequently studied non-cognitive variable, Spielberger (1966) noting approximately 35oo articles or books on the topic in 195o-63, dealing mostly with the relation between anxiety and achievement. Despite the amount of research, there is less theoretical agreement about the anxiety construct than about achievement motivation. The most important research has been done in the United States where, for example distinction can be drawn between the Iowa school (of Taylor, Spence, Farber and others), the Yale school (of Mandler and Sarason) and the motivation researchers collaborating with Atkinson and McClelland. However, in Europe also

some contributions have been made in the past decades, (for example Eysenck, 1957; Thurner, 197o; Fröhlich, 1965), providing a link with American research.
The instruments that have been most widely used in the measurement of anxiety (see Gärtner-Harnach, 1972a) are as follows:

Test Anxiety Questionnaire (TAQ) by Mandler and Sarason
Test Anxiety Scale for Children (TASC) by Sarason et al.
Academic Achievement Test (AAT) by Alpert and Haber
Audience Sensitive Inventory by Paivio et al.
Affect Adjective Check List for the Measurement of Anxiety (AACL) by Zuckerman
Anxiety Differential
General Anxiety Scale for Children (GASC) by Sarason
Manifest Anxiety Scale (MAS) by Taylor
Children's Manifest Anxiety Scale by Castaneda et al.
IPAT Anxiety Scale by Cattell and Scheier
Objective-Analytic Anxiety Battery by Cattell and Scheier

In nearly all European countries, methods appropriate for school children have been tested (at least in their experimental form) and often adopted. In Germany we have - besides some projective tests - the following published scales:

Kinder-Angst-Test (Childrens-Anxiety-Test) by F. Thurner and U. Tewes for the age from 9 to 15.
Angstfragebogen für Schüler (Anxiety scale for pupils) by Wieczerkowski et al. for the age from 9 to 17.
Fragebogen für Schüler, FS 5-1o (Anxiety scale for pupils) by V. Gärtner-Harnach for the age from 1o-15.
Fragebogen für Schüler, FS 11-13 (Anxiety scale for students) by V. Gärtner-Harnach for the age from 17 to 2o.
The German adaptation of the Test Anxiety Scale for children by H. Nickel and P. Schlüter.

These instruments have some roots in the American scales e.g. CMAS, TASC and AAT, but due to the cultural differences the adaptation amounted virtually to new instruments based on research.

Although these and other instruments are available, the measurement of anxiety is very rare in school practice, and there is agreement in all standard works that teachers underestimate the extent and effects of anxiety in school. However, anxiety has frequently been studied in educational research, the main concern being how it has influenced learning and examination performance. Since much of the work in Europe has been in the field of mathematics, we will select a few studies on it. Doris (1959), studying anxiety before mathematics tests and the tendency to blame oneself or others in the case of failure, found a significant correlation in the fifth and sixth forms (r=o.32) between anxiety and marks obtained. However, Johannessen (1967), in a study with 911 Swedish pupils, found that anxious pupils (as indicated by a scale he developed) were no worse in a test than those who were less anxious, but that their performance fell more following censure. Biggs (1962), studying the style of teaching in primary schools in England, found indications that anxiety was induced more by traditional methods in which mechanical drills were emphasized, simple items in arithmetic being less affected than more complex ones.

Gärtner-Harnach (1972) summarized research in another field, that of the anxiety engendered in different examination situations, finding that anxious pupils failed mainly on complex or difficult items rather than on easy ones, and that examinations written against the clock were a particular source of stress for pupils subject to anxiety, but that precisely defined tasks and more frequent examinations with immediate response reduced anxiety. Prior information concerning the type of examination questions also lessened anxiety.

In a study (Prell, 1973), essay-type questions turned out to be more susceptible to anxiety than multiple-choice items, which was in contrast to what the students had expected.

Later on I shall show some correlations between anxiety and other noncognitive variables. At present I like to show only some correlations we found in the 4th grade between sociometric status and anxiety.

Table 4: Correlations between anxiety and sociometric status

	Social choice status (own sex)	Social rejection status (own sex)
Test anxiety	-.26	.11
Manifest anxiety	-.17	.o8
Social anxiety	-.38	.41

According to theoretical assumptions we found the highest connections with social anxiety and the lowest with manifest anxiety. But the correlations are not very high.
On the whole, then, one can say that the present stage of research permits only general directives, as yet providing no specific guidance on how examinations should be conducted.

3. The recording of achievement motivation

In the study of anxiety there are, because of the relation to 'fear of failure', many points of contact with research into achievement motivation, which has been a point of considerable interest since the nineteen-fifties, the decisive influence being that of McClelland and his colleagues. This was complemented by Atkinson's work on risk-taking behaviour, and further developed by Heckhausen and his collaborators. B. Weiner emphasized in particular the importance of cognitive information, and brought the theory of causal explanation (causal attribution) to the promising stage of scientific discussion which it has now reached.
Achievement motivation is recorded mainly through projective tests and questionnaires, the most common of these being the appraisal of picture stories, as for example the Thematic Apperception Test (TAT), a method first introduced by McClelland et al. (1953). Heckhausen (1953) adapted the method to provide equal opportunity for projection for those motivated by success and those afraid of failure, while Meyer et al. (1965) developed a series of pictures intended to appeal more to boys, and Weingarten (1967) a series for girls. These projec-

tive tests are extremely important in psychological research, but cannot be used by teachers, for their evaluation requires appropriate psychological knowledge and extensive objectivity in the evaluation (Sader and Specht, 1967). Even the retest reliability after 4-6 weeks is low (o.4-o.6), and the large amount of time required for the tests must be taken into consideration. It is doubtful also (Wasna, 1973) whether projective methods have any validity for processes that are relevant in school.

It is not surprising then that efforts are being made to develop other methods. The many attempts to develop questionnaires have been disappointing, as correlations with projective tests have been low (Fisch and Schmalt, 197o). According to Schmalt, there were at that time only two recent developments that show promise because the instruments were constructed on the basis of some theory, these being Mehrabian's scales (1968) and Hermans' questionnaires (1968, 197o) in Holland.

Schmalt himself (1973) developed an 'achievement motivation grid', in which children are presented with TAT-like pictures on 18 situations, each with success- and failure-referenced statements. The situations are taken from three of the following fields: manual activities, musical activities, and scholastic activities, independence and self-assertion, helping others, and sport. The grid produced test-retest reliabilities of o.72-o.81 after eight weeks, and was thus comparable with Mehrabian's (1968) method. It records the same factors as projective methods, but 'fear of failure' is split into two factors. Although, as might be expected, those motivated by success showed higher achievement, only in the fields of 'musical activities' and 'helping others' was there valid prediction of achievement. When the grid was used in a comparative study of children (of comparable intelligence) in elementary and special schools (Scherer and Schliep, 1974), those in special schools showed a higher level of 'fear of failure'.

To open new opportunities for research and school practice in our institute we developed two questionnaires for achievement motivation and for the attribution of success and failure in schools (H. Widdel 1977a, 1977b, 1979). Both instruments are standardized for grade 5 to 7, where our research is mostly concentrated upon.

The questionnaire for achievement motivation consists of 38 statements to which the student can place a number from one to five, the five point scale ranging from "always true" to "never true". The questionnaire contains four factors:
1. Aspiration to achievement and readiress to work, 2. level of aspiration, 3. satisfaction of success in school and 4. pleasure in school learning.

The questionnaire for the attribution of success and failure follows the theory by Weiner et al. (1971) and distinguishes between internal attribution for aptitude or effort and external attribution for difficulty of task or chance. The questionnaires offers 24 situations from school life. For each situation four possible explanations are given. Each one has to be rated on a five point scale from "always correct" to "never correct". During a long-during construction time the questionnaire could achieve a sufficient reliability and a validity which besides other criteria confirms the four vectors of attribution by factor analysis.

In a field study with 5th graders we found the following correlations between achievement motivation and attribution.

Table 5: Correlations between achievement motivation and habits of attribution

	N	Attribution			
		Internal positive	External positive	Internal negative	External negative
Achievement motivation	1589	.47	-.29	-.24	.06(ns)

Students with high achievement motivation generally prefer an internal explanation of success in schools. Students with low achievement motivation reduce their success more to external factors like luck or low item difficulty (-.29).

There is no correlation between the attribution of failure and achievement motivation in our sample. For educational purposes it is very important to improve the pupil's internal attribution. Only if they prefer internal attribution they can build up their own responsibility and achieve self-education.

I like to show you some interesting findings concerning the correspondence between achievement motivation and achievement at different levels of intelligence.

Table 6: Correlations between achievement motivation and scholastic achievement at different levels of intelligence

		Intelligence		
	Type of Secondary school	upper third	middle third	lower third
Achievement motivation	Comprehensive	.04	.19**	.09
	n	159	190	181
	Gymnasium	.05	.28*	.19
	n	85	80	77
	Realschule	.19	.26**	.07
	n	133	149	138
	Hauptschule	.22	.47**	.29
	n	25	30	20

** = $p < .01$ * = $p < .05$

Within each type of school there are significant correlations between achievement (sum of marks) and achievement motivation only for the middle third of intelligence. According to many findings in literature achievement motivation determines

success in school to some degree for students with average intelligence. We expect that the level of difficulty in teaching is most appropriate for these students and that they can develop most their achievement motivation. For students with high or low level of intelligence the achievement motivation can explain almost nothing of their success in school.

Other correlations I like to demonstrate later in connection with other variables. Now I am turning to attitude toward school.

4. The measurement of attitudes towards school

With the numerous reforms taking place in schools, the claim if often made that pupils will acquire a more positive attitude towards school and learning, but when it comes to proving this claim only superficial results of inquiries are usually offered. Scientifically tested methods for measuring attitude to school are rare, and have generally been developed in order to improve prediction of cognitive achievement. Questionnaires and scales have been constructed mainly in the United States, and their use only rarely indicates any significant association with success in school, as a survey of the literature by Jackson (1968) showed. Two examples are the study by Jackson and Lahaderne (1967), in which the Michigan Student Questionnaire and the Student Opinion Poll II were used, and that by Jackson and Getzels (1959), in which the Student Opinion Poll was used. There was no significant connection with tests of scholastic attainment, either in the sixth grade or towards the end of Secondary school, but secondary school pupils who had a positive attitude to school showed higher scores in various tests of personality, and Jackson and Getzels therefore saw differences in attitude as a function of personality characteristics. This interpretation was confirmed by Williams (197o), who grouped secondary school pupils according to the California Study Methods Attitudes Toward School Scale, and found that the satisfied group showed higher values on ability, achievement and personality tests.

When intelligence was held constant, significant differences in personality remained, but there were no longer any significant differences on attainment.

In contrast, some other studies showed a connection between attitude to school and success (Malpass, 1953; Brodie, 1964; Carter, 1959), Carter reporting correlations of almost o.6o between scores on the California attitude to school scale and average marks in the tenth and eleventh grades.

Neale et al. (197o) were of the opinion that the measurement of general attitude had less predictive value than the measurement of attitudes towards specific subjects, referring to studies by other workers which had shown significant correlations. They examined attitudes toward school, the teacher, arithmetic, social studies, science and reading, using the semantic differential, and found significant correlations (o.27-o.35) between attitude to a subject and success in it, for social studies, arithmetic and reading among boys, and for reading in the case of girls.

Biggs (1959) found a closer connection between attitude to school and attainment in mathematics than for the mother tongue, a result that was confirmed by Baraheni (1962) and Arvidson (1956). Ormerod (1971) established that the relation between attitudes about the social implications of science and choice for or against a science option appeared stronger in girls than in boys.

Kerlinger and Kaya (1959), Lindgren and Patton (1958) and Remmers (196o) have reported on the development of scales for measuring attitude towards secondary schools, but fewer instruments have been developed for elementary schools, and when the NFER decided in 1963 to investigate streaming in primary schools, no suitable attitude scales could be found. Scales were developed for measuring attitude to school, interest in school work, importance of doing well, attitude to class, 'other' image of class, conforming versus non-conforming, relationship with teacher,anxiety about school work, social adjustment, and self image (Barker Lunn, 1969). The scales were derived empirically, each being made up from a number of statements by children during group discussions, and selected as a result of factor analysis and scalogram analysis.

The ten scales contained 79 statements in all, and there were fairly high intercorrelations, for example 'attitude to school' correlating o.71 with 'interest in school work', o.44 with 'importance of doing well' and o.4o with 'attitude to class'.

Barker Lunn (1972) reported on the application ot the ten scales to about 2ooo junior school children, and found clear sex differences, girls tending to have more school-related attitudes, and boys to have a better academic self-image, to be better socially adjusted, and to be less anxious in the classroom situation. In all aspects of attitude, brighter children tended to have more positive attitudes; and more favourable attitudes tended to be found among middle class than among working class children. Wisenthal (1965) also found that girls tended to have more favourable attitudes to school, and that the attitudes of younger children were more favourable.

In the United Kingdom in particular, there are a number of studies in which specially developed scales have been used, Sharples (1969) and Kniveton (1969), for example using Guttmann scales; Regan (1967) developing a Thurstone-type scale; Dale and Miller (1972) using a semantic differential, and Griffin (1969) a Likert scale.

There has been some tradition in West Germany of research on the popularity of school subjects (Seelig, 1968), but only in the more recent studies have scales for attitude to school been used (Seitz and Bräth, 197o).

However, in all this work, research has been concentrated on research into the relation between cognitive achievement and attitude to school, and there can be no question as yet of any application in school practice, nor of any interest in the attitude to school as such.

In our institute we developed also a questionnaire for attitudes toward school to overcome some weaknesses of past research and practice. The questionnaire "Attitudes toward school" consists of five scales, named as follows:

1. Perception of teacher's undesired behavior, 1o items.
2. Perception of desired behavior of the teacher, 1o items.
3. Readiness to work in school, 1o items.
4. Attitude toward school and learning, 1o items.
5. Relation to classmates, 8 items (Wagner, 1977).

The 48 items must be rated on a five point scale from "exactly right" to "not true at all". The questionnaire is standardized for grade 4 to 6. The correlations between scores in this questionnaire and marks in school range from .o4 to .42, being highest for the subscale "Readiness to work in school" with a median of .27. Like most noncognitive variables "attitude toward school" has low predictive validity for success in school. If you have a valid intelligence test a noncognitive variable will add mostly only 2% of variance. But for the individual case the information about these variables can help to understand and solve a student's problems much better. And between noncognitive variables you will find sometimes remarkable correlations. I will give you an example.

Table 7: Correlations between achievement motivation, attitude toward school, self concept and test anxiety (5^{th} grade)

	Achievement Motivation			
	Comprehensive School n= 439-644	Gymnasium n=151-266	Realschule n=416-474	Hauptschule n=71-1o6
Attitude toward school	.42	.39	.48	.55
Self concept	.38	.42	.52	.64
Test anxiety	-.11*	-.18*	-.15	-.25*

* = $p < .o5$ all others = $p < .o1$

Some correlations between these variables are considerable. If you measure many non-cognitive variables you will find high multiple correlations even to intelligence and the sum of marks. In a field study with about 11oo pupils of the 5^{th}

and 7th grades we had a battery of 3o scales and subscales including self concept, attribution of success and failure, achievement motivation, attitude toward school, anxiety, aggression, cooperative and competetive attitudes etc. The multiple correlation between these battery and intelligence was R = .57, that means a common variance of 32,5%. To the sum of marks the multiple correlation was even R = .67, rising the common variance up to 44,8%.

But the correlations between cognitive and non-cognitive variables are not the interesting point. Non-cognitive variables are in the first place not keys to school research but means to understand and to educate students better, to focus on the development of personalities.

I like to give you one more example. In Germany we have at present a fierce discussion between supporters of the new comprehensive schools and of the traditional tripartite secondary school system. Because we had field research in both school types with the same instruments we could compute how much variance of the non-cognitive variables can be explained by the different school systems. With more than 1ooo students and 1o scales we found an explained variance of 3.6%. But the perception of undesirable teacher behavior explained for the same 1o scales a variance of 2o%. The school organisation may stimulate or hinder the teacher in his social integrative behavior. But for the education in the field of social and emotional factors it is still the impact of the teachers personality which counts first.

6. Discrepancies between the curricular importance of non-cognitive variables and efforts made to assess them

Although only a few examples have been selected from the variety of noncognitive variables, and we have not dealt with the more psychological work on 'self-concept theory' (Hamachek, 1971), or the diagnosis of Cattell's and Eysenck's specific dimensions of personality, the measurement of school climate etc., the following general remarks can be made.

Research into the measurement of non-cognitive variables so far has not matched their importance in the present day curriculum.

In research, non-cognitive variables have almost exclusively been used as additional predictors of cognitive performance, and the fact that they have not been found to contribute much to increasing multiple correlations leads to the premature conclusion that their significance is limited. This conclusion is, however, erroneous, for non-cognitive variables have an intrinsic value which is completely independent of their predictive value in scholastic performance. The reduction of school anxiety, the forming of relevant motivation and interests, education towards emotional stability, and so on, all constitute important aims in education, whether they manifest themselves in an improvement of performance or not, and it is a sign of an exaggerated and false view of efficiency if they are introduced into nearly all investigations merely to assess cognitive achievement.

We need research tc determine whether specific educational aims in the non-cognitive field have been attained, what interdependencies exist between them, and how they can be measured. We require research which enables us to derive precise information concerning sources of error in teacher ratings in this field, and we need new measuring instruments that the teacher can use. If subsequently research is carried out to find the relationship between cognitive and non-cognitive variables, then the question of the importance of specific cognitive characters in attaining non-cognitive aims will have the same significance as the reverse question, which prevails almost exclusively nowadays.

So far the trend in research reveals only a general increase in activity, and only in a few cases has the direction proposed above been pursued.

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